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| WANG, JIN CHENG | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/823,935 | PETERSON ET AL. |
| | Examiner | Art Unit |
| | JIN-CHENG WANG | 2628 |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-6,14,20,21,23 and 25-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 14, 20-21, 23, and 25-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

Applicant's submission filed on 1/21/2009 has been entered. Claims 1, 14, 23, and 27 have been amended. Claims 7-13, 15-19, 22, 24, 33-97 have been canceled. Claims 1-6, 14, 20-21, 23, and 25-32 are pending in the application.

### *Response to Arguments*

Applicant's arguments, filed January 21, 2009 have been considered, but are moot in view of the new ground(s) of rejection set forth in the present Office Action.

Applicant argues in essence with respect to the art rejection. However, Applicant ignore the prior art teaching in relation to the claim recitation set forth in the claim 1 and similar claims.

In a non-limiting example, Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using <u>programmed weight coefficients</u> wherein the enabled samples are less than three. Leather thus teaches <u>calculating the enabled sample values</u> (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS (SEE FIG 6A). Disabled samples are ignored in the calculation of the pixel color data. Leather's two enabled samples per pixel in Fig. 7

meet the claimed “less than three sample values”. Leather’s sampling pattern of two enabled samples per pixel in Fig. 7 meets the claimed sampling pattern.

Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the first row of Fig. 7 wherein the enabled samples are covered by the primitive 612. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS. Disabled samples are ignored in the calculation of the pixel color data. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.

Moreover, the claim 2 is directed to non-statutory subject matter. The claim 2 recites the method of claim 1 which recites “[a] computer-readable medium". The claim 1 is an apparatus while the claim 2 is a method and yet the claim 2 depends upon the claim 1.

A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *> IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005);<Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990) *>(< claim directed to an automatic transmission workstand and the method * of using it * held ** ambiguous and properly rejected under 35 U.S.C. 112, second paragraph>)<. See MPEP 2173.05(p). The claims 3-6, 20-21, 25-26 and 28-32 are subject to the same rationale of rejection set forth in the claim 1.

Claim 1, 14, 23 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In a non-limiting example, the claim 1 recites “[a] computer-readable medium” However, the specification failed to disclose the computer-readable medium. Moreover, there is no disclosure that the instructions set forth in the claim 1 are stored in a computer-readable medium. See lines 12-21 of Page 18, the software languages/operations executed in a graphics processor do not necessarily mean they are stored in any computer-readable medium. Even if samples are stored in a memory, this cannot be construed as instructions for producing the samples are stored in a memory.

To comply with the "written description" requirement of 35 U.S.C. § 112, first paragraph, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the "written description" inquiry, whatever is now claimed. Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991 ). For purposes of written description, one shows "possession" by descriptive means such as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). There is no such descriptive means in the disclosure for the inventions of claim 1. The claims 14, 23 and 27 are subject to the same rationale of rejection as the claim 1.

With respect to the claims 23 and 27, Claims 23 and 27 are broadly construed and are fulfilled by Deering.

As addressed below, Deering teaches a computer readable medium having processor executable instructions, which when executed by a processor (Figs. 1-3), perform a method for calculating values for pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively (Fig. 5A), comprising:

Calculating sample values for pixels of the image in accordance with first and second sampling rates (*Fig. 5A shows two sample rates---the first pixel in the first column is sampled with one sample and the second pixel in the second column is sampled with two samples*), the sampling rate defined by the number of samples per pixel and at least one sample per pixel (*Fig. 5A shows the first sampling rate defined by one sample and the second sampling rate defined by two samples*), a sampling rate remaining constant for consecutive pixels arranged along any one given line parallel to the first axis (*the first sampling rate of Fig. 5A remaining constant for consecutive pixels arranged along any given line parallel to the vertical axis. In the same manner the second sampling rate of Fig. 5A remains constant for consecutive pixels arranged along any given line parallel to the vertical axis*) and varying between the first and second sampling rates for consecutive pixels arranged along any one given line parallel to the second axis (This claim language does not make sense, *a sampling rate varying between the first and second sampling rates*?

*The Deering Fig. 5A shows the first sampling rate changes to the second sampling rate for consecutive pixels arranged along any one given line parallel to the horizontal axis.*

*Deering discloses in Fig. 5A* *the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels; the sampling rate remaining constant for consecutive pixels arranged along any given vertical line parallel to the vertical axis and varying between the first and second sampling rates for consecutive pixels arranged along any given horizontal line parallel to the horizontal axis*);

Calculating values for pixels of the image from a respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Providing the calculated values as graphics data for the image (Deering Fig. 7).

Applicant argues with respect to the claim 14. However, Leather teaches in Figs. 6-7 a first sampling pattern of two samples and a second sampling pattern of two samples wherein the first sampling pattern is rotated 90 degree from the second sampling pattern. Leather teaches in Fig. 7 a sampling pattern of two enabled samples and a second sampling pattern of two enabled samples and the first sampling pattern is rotated 90 degree from the second sampling pattern.

Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients

wherein the enabled samples are less than three. Leather thus teaches <u>calculating the enabled sample values</u> (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS (SEE FIG 6A). Disabled samples are ignored in the calculation of the pixel color data.

Leather teaches <u>a first sampling pattern of the enabled samples</u> for the first pixel in the first row of Fig. 7 and <u>a second sampling pattern of the enabled samples for the second pixel</u> in the first row of Fig. 7 wherein the enabled samples are covered by the primitive 612. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS. Disabled samples are ignored in the calculation of the pixel color data. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.

As addressed below, Leather teaches a computer-readable medium having processor-executable instructions, which when executed by a processor (Figs. 1-5), perform a method for generating an image having pixels arranged in rows and columns parallel to first and second perpendicular axes (Fig. 6-7), respectively, comprising:

Calculating two sample values per pixel of the image (*Leather teaches this. Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches in Fig. 7 in relation to the block 552 of Fig. 6A two enabled pixels covered by the primitive 612 and only the enabled pixels are calculated in accordance with the teaching of Fig. 6A. Therefore, Leather teaches in Fig. 6-7 calculating two enabled samples using the multi-sample coverage mask for the first pixel and calculating two enabled samples for the second pixel along the horizontal line*) in accordance with a plurality of sampling patterns (Fig. 9; *Leather teaches in Fig. 7 in relation to the block 552 of Fig. 6A two enabled pixels covered by the primitive 612 and only the enabled pixels are calculated in accordance with the teaching of Fig. 6A. Therefore, Leather teaches in Fig. 6-7 calculating two enabled samples using the multi-sample coverage mask for the first pixel and calculating two enabled samples for the second pixel along the horizontal line. Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612*), one sampling pattern per pixel, one pair of sampling points per

sampling pattern (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612*), a first sampling pattern defines two sample positions symmetrically located relative to a center of a given pixel on opposite sides of a line parallel to a first axis of the image (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. The first sampling pattern defines two enabled sample positions symmetrically located relative to a center of the first pixel in the first row on opposite sides of a line parallel to the horizontal axis of the image*) and dividing the respective pixel in half (*the first pixel in the first row of Fig. 7 is thus divided by the line crossing the center of the first pixel parallel to the horizontal axis*), and a second sampling pattern defines two sample positions symmetrically located relative to a center of a given pixel on opposite sides of a line parallel to a second axis of the image and dividing the respective pixels in half (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. The second sampling pattern defines two enabled sample positions symmetrically located relative to a center of the second pixel in the first row on opposite sides of a line parallel to the vertical axis of the image*), the second sampling pattern substantially corresponding to the first sampling pattern rotated 90 degrees (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled*

*samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree*);

Calculating a value for at least one pixel of the image from a respective pair or pairs of calculated sample values (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree.*

*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*); and

Storing the calculated value for the at least one pixel for use as graphics data for the image (column 6, lines 15-67).

Applicant argues with respect to the claim 1 and similar claim in light of the claim limitation of calculating less than three sample values. However, Leather teaches this.

Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied

by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS (SEE FIG 6A). Disabled samples are ignored in the calculation of the pixel color data.

Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the first row of Fig. 7 wherein the enabled samples are covered by the primitive 612. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS. Disabled samples are ignored in the calculation of the pixel color data. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.

As addressed below, Leather teaches a computer-readable medium having processor-executable instructions, which when executed by a processor (Figs. 1-5), perform a method for calculating values for pixels of an image (Fig. 9 and Figs. 6-7), comprising:

Calculating less than three sample values (*This claim limitation is unclear and indefinite because calculating less than three sample values includes calculating one sample values or calculating two sample values or calculating zero sample values. Because this claim limitation together with the following claim limitations is construed to encompass the scope of invention wherein the sampling pattern only has one sample per pixel.*

*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.*

*Leather teaches this. Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample*

*coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches in column 7, lines 19-25 that calculating three samples encompasses the step of calculating two sample values. Moreover Leather teaches two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*) for pixels of an image in accordance with a sampling pattern for each pixel, the sampling pattern for consecutive pixels alternating between a first and a second sampling pattern, wherein the calculation includes calculating a pair of sample values for <u>pixels</u> of an image in accordance with a sampling pattern for each pixel (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.*

*Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three.*

*Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches the sample calculation includes at least calculating a pair of sample values for pixels of an image; See Figs. 5A and 9. Leather teaches the sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image; see Fig. 5A in relation to Fig. 9*); each sampling pattern defining one or more sampling locations at which sample values are calculated and the second sampling pattern corresponds to the first sampling pattern rotated 90 degrees (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree.* See 5A in relation to Fig. 9), the sampling locations being relative to a pixel (*e.g., Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree. Leather 5A in relation to Fig. 9*);

Determining a value for at least one pixel by combining sample values calculated for the sampling locations for the pixel (*e.g., Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled*

*samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree. Leather Fig. 9*); and

Producing the value for the at least one pixel to be saved as graphics data for the image (column 6, lines 15-67).

In view of the amendment set forth in the claim 14, a new ground of rejection is set forth in the present Office Action based on the prior Office Action. The Examiner asserts that the claim invention construed in the presently amended claim 14 is fulfilled by Leather.

Additionally, for the arguments' sake, even if Fig. 5A or Fig. 9 is taken alone in comparison with the claim recitation set forth in Applicant's claim 14, the Examiner asserts that Applicant's claim invention is an obvious variant of Leather's disclosure at Fig. 5A for the following reasons.

Leather discloses at Fig. 5A three programmable sampling locations per pixel. If Leather's Fig. 5A shows two programmable sampling locations per pixel, the claim invention is fully fulfilled by Leather. However, the Examiner asserts Applicant's claim invention, set forth in the claim 14, after numerous amendments, is an obvious variant of Leather (Applicant is advised that Applicant could have also amended the claim 14 to calculate four samples or the calculate five samples per pixel sampling pattern----all of them are obvious variants of Leather). Although Applicant's claim invention is related to a sampling pattern having two samples while Leather shows a rotated sampling pattern of three samples, it would have been obvious to one of

the ordinary skill in the art at the time the invention was made to have realized more than three or less than three samples may be sampled at least because Leather teaches programmable sampling locations and the number of samples per sampling pattern is just a non-limiting example as shown in Fig. 5A. The claim 14 is within the scope of invention set forth in Leather's Fig. 5A in view of Leather Abstract wherein Leather teaches more than 12 programmable sampling locations and the sampling locations are freely selectable wherein Fig. 5A shows three sample locations. One skilled in the art knows that one may choose two samples per pixel, one may choose three samples per pixel, or one may choose four or more samples per pixel. Leather’s Fig. 5A only shows a non-limiting example. Leather at least implicitly teaches or suggests the claim limitation by teaching programmable sampling locations wherein the locations of samples are selectable. The most important feature is the rotated sampling patterns by 90 degrees which has been taught in Leather Fig. 5A. One of the ordinary skill in the art understands that one may choose particular sampling locations to come up with any obvious variants as construed in the numerous amendments by Applicants. One of the ordinary skill in the art would be motivated to do so to provide two specific programmable locations to obtain a sampling pattern.

***Claim Objections***

Claim 1 is objected to because of the following informalities: It is not clear whether a computer-readable medium comprising or the method comprising. at line 3 of the claim 1, “comprising” should be “the method comprising”. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2-6, 20-21, 25-26, 28-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In a non-limiting example, the claim 2 is directed to non-statutory subject matter. The claim 2 recites the method of claim 1 which recites “[a] computer-readable medium". The claim 1 is an apparatus while the claim 2 is a method and yet the claim 2 depends upon the claim 1.

A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *> IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005);<Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990) *>(< claim directed to an automatic transmission workstand and the method * of using it * held ** ambiguous and properly rejected under 35 U.S.C. 112, second paragraph>)<. See MPEP 2173.05(p). The claims 3-6, 20-21, 25-26 and 28-32 are subject to the same rationale of rejection set forth in the claim 1.

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claim 2-6, 20-21, 25-26, 28-32 are directed to non-statutory subject matter. In a non-limiting example, the claim 2 is directed to non-statutory subject matter. The claim 2 recites the method of claim 1 which recites “[a] computer-readable medium". The claim 1 is an apparatus while the claim 2 is a method and yet the claim 2 depends upon the claim 1.

The claim is directed to neither a “process” nor a “machine,” but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. Id. at 1551. See MPEP 2173.05(p). The claims 3-6, 20-21, 25-26 and 28-32 are subject to the same rationale of rejection set forth in the claim 1.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1, 14, 23 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In a non-limiting example, the claim 1 recites “[a] computer-readable medium” However, the specification failed to disclose the computer-readable medium. Moreover, there is no disclosure that the instructions set forth in the claim 1 are stored in a computer-readable medium. See lines 12-21 of Page 18, the software languages/operations executed in a graphics processor are not mean they are stored in any computer-readable medium. Even if samples are stored in a memory, this cannot be construed as instructions for producing the samples are stored in a memory.

To comply with the "written description" requirement of 35 U.S.C. § 112, first paragraph, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the "written description" inquiry, whatever is now claimed. Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991 ). For purposes of written description, one shows "possession" by descriptive means such as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). There is no such descriptive means in the disclosure for the inventions of claim 1. The claims 14, 23 and 27 are subject to the same rationale of rejection as the claim 1.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Leather et al. U.S. Pat. No. 6,999,100 (hereinafter Leather).

Claim 1:

Leather teaches a computer-readable medium having processor-executable instructions, which when executed by a processor (Figs. 1-5), perform a method for calculating values for pixels of an image (Fig. 9), comprising:

Calculating less than three sample values (

*Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to*

*three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.*

*Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches in column 7, lines 19-25 and block 550b of Fig. 6A that calculating three samples encompasses the step of calculating two sample values by enabling/disabling samples based on portion of pixels occupied by a primitive and primitive depth. Moreover Leather teaches two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled*

*samples to determine the final color for the pixel*) for pixels of an image in accordance with a sampling pattern for each pixel, the sampling pattern for consecutive pixels alternating between a first and a second sampling pattern, wherein the calculation includes calculating a pair of sample values for pixels of an image in accordance with a sampling pattern for each pixel (*Leather teaches this. Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image; see Fig. 9*); each sampling pattern defining one or more sampling locations at which sample values are calculated and the second sampling pattern corresponds to the first sampling pattern rotated 90 degrees (*Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to*

*three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree.*

See Fig. 9), the sampling locations being relative to a pixel (*e.g., Leather Fig. 9*);

Determining a value for at least one pixel by combining sample values calculated for the sampling locations for the pixel (*e.g., Leather Fig. 9*); and

Producing the value for the at least one pixel to be saved as graphics data for the image (column 6, lines 15-67).

Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.

ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS (SEE FIG 6A). Disabled samples are ignored in the calculation of the pixel color data.

Leather teaches <u>a first sampling pattern of the enabled samples</u> for the first pixel in the first row of Fig. 7 and <u>a second sampling pattern of the enabled samples for the second pixel</u> in the first row of Fig. 7 wherein the enabled samples are covered by the primitive 612. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS. Disabled samples are ignored in the calculation of the pixel color data. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.

Claims 23 and 25-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Deering U.S. Pat. No. 6,664,955 (hereinafter Deering).

Claim 23:

Deering teaches a computer readable medium having processor executable instructions, which when executed by a processor (Figs. 1-3), perform a method for calculating values for

pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating sample values for pixels of the image in accordance with a plurality of sampling rates, a sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate differing for at least two pixels of the image (*Deering discloses in Fig. 5A* <u>*the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels*</u>) and alternating per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image (*Deering discloses in Fig. 5A alternating per pixel for consecutive pixels along the horizontal lines dividing the pixels wherein the horizontal lines are parallel to horizontal axis of the image;* <u>*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*</u>); the at least two pixels having the differing sampling rates belonging to a sampling rate set and the sampling rate set repeated for the pixels along the horizontal <u>or</u> vertical lines (*The claim is subject to the broadest reasonable interpretation consistent with applicant's specification. The alternative "OR" has been recited in the claim. The prior art Deering reference teaches this claim limitation for the following reasons. See Deering Fig. 5A the first two pixels along the horizontal axis have two different sampling rates---i.e., the first pixel is sampled with one sample and the second pixel is sampled with two samples and the two sampling rates belong to a set of two sampling rates----this sampling pattern of the set of two sampling rates at least repeats along any vertical lines*)

Calculating values for pixels of the image from respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Storing the values for the pixels as graphics data for the image (Fig. 7).

Claim 25:

The claim 25 encompasses the same scope of invention as that of claim 23 except additional claimed limitation of the sampling rate being constant for the pixels arranged along any given line parallel to the first axis and varies among the plurality of sampling rates for the pixels arranged along any given line parallel to the second axis.

However, Deering further discloses the claimed limitation of the sampling rate being constant for the pixels arranged along any given line parallel to the first axis and varies among the plurality of sampling rates for the pixels arranged along any given line parallel to the second axis (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*).

Claim 26:

The claim 26 encompasses the same scope of invention as that of claim 25 except additional claimed limitation of the first and second sampling rates alternating per pixel for consecutive pixels in any line parallel to the second axis.

However, Deering further discloses the claimed limitation of the first and second sampling rates alternating per pixel for consecutive pixels in any line parallel to the second axis (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*).

Claim 27:

Deering teaches a computer readable medium having processor executable instructions, which when executed by a processor (Figs. 1-3), perform a method for calculating values for pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively (Fig. 5A), comprising:

Calculating sample values for pixels of the image in accordance with first and second sampling rates (*Fig. 5A shows two sample rates---the first pixel in the first column is sampled with one sample and the second pixel in the second column is sampled with two samples*), the sampling rate defined by the number of samples per pixel and at least one sample per pixel (*Fig. 5A shows the first sampling rate defined by one sample and the second sampling rate defined by two samples*), a sampling rate remaining constant for consecutive pixels arranged along any one given line parallel to the first axis (*the first sampling rate of Fig. 5A remaining constant for consecutive pixels arranged along any given line parallel to the vertical axis. In the same manner the second sampling rate of Fig. 5A remains constant for consecutive pixels arranged along any given line parallel to the vertical axis*) and varying between the first and second sampling rates for consecutive pixels arranged along any one given line parallel to the second axis (This claim language does not make sense, *a sampling rate varying between the first and second sampling rates*?

*The Deering Fig. 5A shows the first sampling rate changes to the second sampling rate for consecutive pixels arranged along any one given line parallel to the horizontal axis.*

*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and*

*the second sampling pattern corresponds to the pattern for the filtered pixels; the sampling rate remaining constant for consecutive pixels arranged along any given vertical line parallel to the vertical axis and varying between the first and second sampling rates for consecutive pixels arranged along any given horizontal line parallel to the horizontal axis*);

Calculating values for pixels of the image from a respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Providing the calculated values as graphics data for the image (Deering Fig. 7).

Claim 28:

The claim 28 encompasses the same scope of invention as that of claim 27 except additional claimed limitation of the pixels of the image being arranged in rows parallel to the first axis and columns parallel to the second axis, and the first and second sampling rates alternating every row of pixels. However, Deering further discloses the claimed limitation of the pixels of the image being arranged in rows parallel to the first axis and columns parallel to the second axis, and the first and second sampling rates alternating every row of pixels (*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels*).

Re Claim 29:

Deering further discloses in Fig. 5A and Fig. 23 that the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel.

Re Claim 30:

Deering further discloses in Fig. 5A and Fig. 23 the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel, the two sample locations per pixel for the first sampling rate arranged within a pixel along a line forming an acute angle with respect to either the first or second axes.

Re Claim 31:

Deering further discloses in Fig. 5A and Fig. 23 that the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel, the two samples per pixel for the first sampling rate arranged within a pixel substantially along and on opposite sides of a line parallel to either the first or second axes that divides the pixel in two, the axis to which the line is parallel alternating per consecutive pixel arranged along a line parallel to the first axis.

Re Claim 32:

Deering further discloses in Fig. 5A that the two samples per pixel of the first sampling rate vary for every other consecutive pixel lying along a line parallel to the first axis between a given sampling pattern and another sampling pattern which is substantially the same pattern rotated 90 degrees.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leather et al. U.S. Pat. No. 6,999,100 (hereinafter Leather).

Claim 14:

Leather teaches a computer-readable medium having processor-executable instructions, which when executed by a processor (Figs. 1-5), perform a method for generating an image having pixels arranged in rows and columns parallel to first and second perpendicular axes (Fig. 9), respectively, comprising:

Calculating two sample values per pixel of the image (*Leather teaches this. Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches calculating the enabled sample values (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows less than three enabled sample values be calculated in the block 552 of Fig. 6A.*

*Leather teaches in Fig. 7 in relation to the block 552 of Fig. 6A two enabled pixels covered by the primitive 612 and only the enabled pixels are calculated in accordance with the teaching of Fig. 6A. Therefore, Leather teaches in Fig. 6-7 calculating two enabled samples using the multi-sample coverage mask for the first pixel and calculating two enabled samples for the second pixel along the horizontal line.*

*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*) in accordance with a plurality of sampling patterns (Fig. 9; *Leather teaches in Fig. 7 in relation to the block 552 of Fig. 6A two enabled pixels covered by the primitive 612 and only the enabled pixels are calculated in accordance with the teaching of Fig. 6A. Therefore, Leather teaches in Fig. 6-7 calculating two enabled samples using the multi-sample coverage mask for the first pixel and calculating two enabled samples for the second pixel along the horizontal line. Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612*), one sampling pattern per pixel, one pair of sampling points per sampling pattern (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612.*

*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final*

*color for the pixel*), a first sampling pattern defines two sample positions symmetrically located relative to a center of a given pixel on opposite sides of a line parallel to a first axis of the image (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. The first sampling pattern defines two enabled sample positions symmetrically located relative to a center of the first pixel in the first row on opposite sides of a line parallel to the horizontal axis of the image*) and dividing the respective pixel in half (*the first pixel in the first row of Fig. 7 is thus divided by the line crossing the center of the first pixel parallel to the horizontal axis*), and a second sampling pattern defines two sample positions symmetrically located relative to a center of a given pixel on opposite sides of a line parallel to a second axis of the image and dividing the respective pixels in half (*Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. The second sampling pattern defines two enabled sample positions symmetrically located relative to a center of the second pixel in the first row on opposite sides of a line parallel to the vertical axis of the image.*

*Leather teaches sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image and calculating two sample values for pixels of an image; see Fig. 9*), the second sampling pattern substantially corresponding to the first sampling pattern rotated 90 degrees (See Fig. 9; *Leather teaches a first sampling pattern of the enabled samples for the first pixel in the first row of Fig. 7 and a second*

*sampling pattern of the enabled samples for the second pixel in the second row of Fig. 7 wherein the enabled samples are covered by the primitive 612. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated 90 degree*);

Calculating a value for at least one pixel of the image from a respective pair or pairs of calculated sample values (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*); and

Storing the calculated value for the at least one pixel for use as graphics data for the image (column 6, lines 15-67).

Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using <u>programmed weight coefficients</u> wherein the enabled samples are less than three. Leather thus teaches <u>calculating the enabled sample values</u> (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows

less than three enabled sample values be calculated in the block 552 of Fig. 6A. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS (SEE FIG 6A). Disabled samples are ignored in the calculation of the pixel color data.

Leather teaches <u>a first sampling pattern of the enabled samples</u> for the first pixel in the first row of Fig. 7 and <u>a second sampling pattern of the enabled samples for the second pixel</u> in the first row of Fig. 7 wherein the enabled samples are covered by the primitive 612. ONLY ENABLED SAMPLES ARE CALCULATED FOR THE PIXEL COLOR DATA USING WEIGHT COEFFICIENTS. Disabled samples are ignored in the calculation of the pixel color data. Leather teaches the first sampling pattern of the two enabled pixels corresponds to the second sampling pattern of the two enabled pixels rotated by 90 degree.

Additionally, for the arguments' sake, even if Fig. 5A or Fig. 9 is taken alone in comparison with the claim recitation set forth in Applicant's claim 14, the Examiner asserts that Applicant's claim invention is an obvious variant of Leather's disclosure at Fig. 5A for the following reasons. Leather discloses at Fig. 5A three programmable sampling locations per pixel. If Leather's Fig. 5A shows two programmable sampling locations per pixel, the claim invention is fully fulfilled by Leather. However, the Examiner asserts Applicant's claim invention, set forth

in the claim 14, after numerous amendments, is an obvious variant of Leather. Leather teaches in the block 550b of Fig. 6A creating a multi-sample coverage mask for enabling/disabling samples based on portion of a pixel occupied by a primitive and primitive data. Leather teaches using a multi-sample coverage mask for enabling/disabling the three samples per pixel of Fig. 5A to calculate the enabled samples in block 552 of Fig. 6A using programmed weight coefficients wherein the enabled samples are less than or equal to three. Leather thus teaches a sampling pattern with enabled samples including a sampling with only two enabled samples (inherently less than or equal to three) based on the sampling pattern of Fig. 5A using the multi-sample coverage mask which allows two enabled sample values be calculated in the block 552 of Fig. 6A.

Although Applicant's claim invention is related to a sampling pattern having two enabled samples while Leather shows a rotated sampling pattern of three samples and a sampling pattern of less than or equal to three enabled samples, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to have realized more than three or less than three samples may be sampled at least because Leather teaches programmable sampling locations and the number of the samples per sampling pattern is just a non-limiting example as shown in Fig. 5A. A sampling pattern of two enabled samples is also implicitly taught in the block 552 of Fig. 5A. The claim 14 is within the scope of invention set forth in Leather's Fig. 5A in view of Leather Abstract and the block 552 of Fig. 6A wherein Leather teaches more than 12*12 programmable sampling locations and the sampling locations are freely selectable wherein Fig. 5A shows three sample locations and Fig. 6A shows a sampling pattern of less than three or equal to three enabled samples. One skilled in the art knows that one may choose two

samples per pixel or choose two enabled samples per pixel for calculation, one may choose three samples per pixel, or one may choose four or more samples per pixel. Leather's Fig. 5A only shows a non-limiting example. Leather at least implicitly teaches or suggests the claim limitation by teaching programmable sampling locations wherein the locations of samples are selectable. The most important feature is the rotated sampling patterns by 90 degrees which has been taught in Leather Fig. 5A. One of the ordinary skill in the art understands that one may choose particular sampling locations to come up with any obvious variants as construed in the numerous amendments by Applicants. One of the ordinary skill in the art would be motivated to do so to provide two specific programmable locations to obtain a sampling pattern of two enabled samples (Fig. 6A-7).

Claim 20:

The claim 20 encompasses the same scope of invention as that of claim 14 except additional claimed limitation that all sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four array of sub-regions and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions, the plurality of sampling patterns comprising first and second sampling patterns, each defining two sampling positions from the four potential sampling positions, the first sampling pattern having sample locations in the first and fourth rows of the array and the second sampling pattern having sample locations in the second and third rows of the array.

However, Leather further discloses the claimed limitation that all sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four array of sub-regions and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions, the plurality of sampling patterns comprising first and second sampling patterns, each defining two sampling positions from the four potential sampling positions, the first sampling pattern having sample locations in the first and fourth rows of the array and the second sampling pattern having sample locations in the second and third rows of the array (*See Leather Fig. 9, wherein the sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four arrays of sub-regions---each region having a 3*3 sub-pixels, and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions , the plurality of sampling patterns comprising first and second sampling patterns with the second sampling pattern rotated 90 degree, each defining two enabled sampling positions from the three sampling positions or the four potential sampling positions in the array because there exists at least four potential sampling positions that can be generated; see also column 7*).

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jin-Cheng Wang/
Primary Examiner, Art Unit 2628